
Issues in Employee Coverage and Use

Simulating the Impact of Medical Savings Accounts on Small Business

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Objective. To simulate whether allowing small businesses to offer employer-funded medical savings accounts (MSAs) would change the amount or type of insurance coverage.

Study Setting. Economic policy evaluation using a national probability sample of nonelderly non-institutionalized Americans from the 1993 Current Population Survey (CPS).

Study Design. We used a behavioral simulation model to predict the effect of MSAs on the insurance choices of employees of small businesses (and their families). The model predicts spending by each family in a FFS plan, an HMO plan, an MSA, and no insurance. These predictions allow us to compute community-rated premiums for each plan, but with firm-specific load fees. Within each firm, employees then evaluate each option, and the firm decides whether to offer insurance—and what type—based on these evaluations. If firms offer insurance, we consider two scenarios: (1) all workers elect coverage; and (2) workers can decline the coverage in return for a wage increase.

Principal Findings. In the long run, under simulated conditions, tax-advantaged MSAs could attract 56 percent of all employees offered a plan by small businesses. However, the fraction of small-business employees offered insurance increases only from 41 percent to 43 percent when MSAs become an option. Many employees now signing up for a FFS plan would switch to MSAs if they were universally available.

Conclusions. Our simulations suggest that MSAs will provide a limited impetus to businesses that do not currently cover insurance. However, MSAs could be desirable to workers in firms that already offer HMOs or standard FFS plans. As a result, expanding MSA availability could make it a major form of insurance for covered workers in small businesses. Overall welfare would increase slightly.

Key Words. Medical savings accounts, health insurance, policy simulation

In recent years, U.S. health policymakers have faced an important dilemma: the growing number of uninsured persons and high rates of growth in health-care costs. Concern about healthcare spending has limited the willingness of policymakers to consider reforms that might substantially increase insurance coverage because increased coverage would further stimulate health spending. Therefore, much of the effort to expand insurance involves modest reforms for certain populations considered exceptionally vulnerable.

Cost-containment efforts have also met with limited success. Most reforms aimed at controlling costs directly intercede in the patient-provider relationship, either through price regulation or managed care arrangements. But regulatory efforts are viewed by many as having failed to contain costs, and there is significant dissatisfaction with the controls imposed by managed care.

A recently enacted federal demonstration that encourages the use of medical savings accounts (MSAs) has the potential to solve both these problems. MSAs combine a high-deductible catastrophic insurance plan with a special savings account into which funds are deposited. MSA funds can be used to pay for uncovered healthcare expenses. While proponents of MSAs argue that the plan will control costs without burdensome administration, previous research has shown that MSAs will have only a modest effect on healthcare costs (Keeler et al. 1996; Ozanne 1996). Ultimately then, the fate of MSA legislation may depend on its effect on the uninsured. If MSAs encourage small businesses to offer insurance, then Congress may be more favorably disposed to extend MSA legislation.

In this article we simulate the effects of offering an MSA option to small-business employees. We examine how the presence of an MSA option would affect the fraction of firms that offer insurance, the number of uninsured, and the mix of plan types. We also investigate some of the social welfare implications of these changes.

Several caveats should be noted at the outset. First, our model is designed to simulate a long-run equilibrium with universal availability of MSAs. To date, MSA enrollment has been very low, in part because its

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demonstration status has dramatically limited supply (U.S. General Accounting Office [GAO] 1997). Thus, the findings here do not reflect the results we expect from this short-lived demonstration with capped enrollment. Second, the small-group insurance market is very complicated, and our model simplifies reality. We make several key assumptions about the operation of markets—especially that premiums are community rated and that MSAs can be funded only by employers—to make the model tractable. We return to some possible biases from our assumptions at the end of the article.

THE PROBLEM OF THE UNINSURED

Most of the uninsured live in households with a working member (Employee Benefits Research Institute [EBRI] 1996). Of the 36 million non-elderly workers without employer-sponsored insurance, 23 million are uninsured (Table 1). The remainder purchase insurance privately or obtain coverage through public sources such as Medicare or Medicaid. Fifty-nine percent of uninsured (non-elderly private-sector) workers are employed in small firms and half of the uninsured have a family head who either works in a small firm or is self-employed (EBRI 1996).

Table 1 shows a strong link between firm size and whether employees are covered by insurance. Among firms with fewer than ten employees, only 26 percent have employer-sponsored insurance (ESI) in their own name. ESI in workers' own names is much more common for workers in firms with 25 to 99 employees. This is not surprising, because loading fees vary with group size. Thus, small employers face a higher price for insurance and are less likely to offer it to their employees. In a 1993 survey of small firms that do not offer insurance, Morrissey, Jensen, and Morlock (1994) find that 86 percent

Table 1: Health Insurance Coverage of Workers Age 18–64

	<i>All Firms</i>	<i>Firm Size</i>		
		<i>< 10</i>	<i>10–24</i>	<i>25–99</i>
No. of workers (millions)	130.6	15.4	11.4	15.4
% Uninsured	17.6	32.7	27.6	20.3
% With ESI*	72.4	50.3	60.8	71.0
% With ESI, own name	55.3	25.8	38.8	54.4

Source: Employee Benefits Research Institute calculations from the March 1996 Current Population Survey.

*Employer-sponsored insurance.

describe premiums as prohibitively expensive.¹ Legislation has focused on reforming the small-group markets, but these reforms have had very little effect (Morrissey, Jensen, and Morlock 1994; Nichols, Blumberg, Acs, et al. 1997). Proponents of MSAs argue that their low premiums will make MSAs attractive to these businesses (Gramm 1994; Goodman and Musgrave 1994).

OVERCONSUMPTION OF MEDICAL CARE

Under current tax law, employer contributions to health insurance premiums are excluded from personal income, and hence are exempt from income and payroll taxes. This exclusion gives workers an incentive to buy insurance through their employer and to prepay healthcare costs through premiums, rather than to pay out-of-pocket (Feldstein and Friedman 1977; Pauly 1986). They do so by buying generous fee-for-service (FFS) policies or by purchasing care from health maintenance organizations (HMOs) that is prepaid except for minor visit fees. The resulting proliferation of policies with low cost sharing encourages overconsumption of medical services (Gruber and Poterba 1994).

For example, many FFS plans require patients to pay only 20 percent of the actual price of care. At this discounted price, patients buy some healthcare services they would not buy without insurance. Society as a whole wastes resources on this excessive care to the extent that the costs of producing it exceed that amount that patients would be willing to pay. With fully prepaid care, the fees are even lower but the provider or insurance company has an incentive to manage care to reduce costs, with some administrative cost.

Catastrophic insurance operates differently. Although catastrophic plans reimburse providers on a fee-for-service basis, patients face a high deductible for healthcare expenses. This forces the patient to pay 100 percent of the cost for most medical services while he or she continues to maintain insurance against high-cost health episodes. The RAND Health Insurance Experiment (HIE) showed that people use fewer medical services when they have to pay for more of their care out of their own pockets (Newhouse 1993).

FEDERAL MSA LEGISLATION

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) authorizes a demonstration of MSAs for workers in small businesses and the self-employed. To encourage the purchase of catastrophic insurance, the law links them to tax-subsidized medical savings accounts (MSAs). The savings

account is the actual "MSA," but the term often refers to the combination of a catastrophic policy and savings account. Under the HIPAA, employees of small firms (50 or fewer employees) and self-employed individuals who purchase qualifying high-deductible insurance plans can set up an MSA and may receive a federal tax benefit.² MSA funds can be used to pay for uncovered healthcare expenses. Unused funds revert back to the beneficiary without penalty at retirement.

If the MSA is funded by the employer, contributions are treated just like premium contributions under the current system: the money is not counted as income and is therefore exempt from federal income and social security payroll taxes. Some MSA enrollees may also receive a state tax benefit. At least 17 states have passed laws recognizing use of MSAs for state income tax.

The HIPAA law also allows employees to set up an MSA on their own: an employee-funded MSA. However, these MSAs are much less desirable for most small-business employees. First, they are not exempt from social security payroll taxes, which are a substantial part of the tax burden for most low- and middle-income Americans. Second, very few firms offer catastrophic insurance that would qualify the employee for an MSA. Third, although the employee could purchase the catastrophic insurance in the individual market on his/her own, the premium contribution would then be subject to both income and payroll taxes; further, the individual market has notoriously high loading fees. As a result, we focus our attention on employer-funded MSAs.³

METHODS

We use a behavioral simulation model of spending and choice applied to March 1993 Current Population Survey (CPS) data. The model predicts the effect of MSAs on the insurance choices of self-employed Americans and those employed by small businesses. Because the CPS is not a firm-based survey, workers were combined into synthetic firms based on characteristics reported in the CPS,⁴ and the decision at each synthetic firm was modeled. The methodology and actual firm assignments developed are described in Buchanan and Marquis (1998).

A similar model was employed by Keeler et al. (1996) to look at MSAs, but several important distinctions can be made between that article and this one. First, that study looked at choices for all Americans, not specifically for employees of small firms and their families. Second, that model assumed that all workers were employed by a company that offered a menu of four

insurance plans. In this article we assume that small businesses will offer at most one of those four plans, and we focus directly on how MSAs will affect the offer decision.⁵ Our model can be broken down into the following steps:

1. Model spending by families in the CPS for a hypothetical set of insurance plans;
2. Compute firm-level premiums based on community rating with loading fees adjusted to firm size;
3. Model each family's evaluation of the available insurance plans relative to no insurance;
4. Model the firm's decision about which plan to offer to its employees, if any; and
5. If the firm offers insurance, identify whether or not the family wants to buy it. (In the base case, we assume that all employees must accept the offered plan.)

In doing so, we assume that workers bear all of the cost of health insurance, so firms are essentially indifferent between insurance offers to employees; a firm's decision reflects the preferences of its employees. We return to this point later in the article when we discuss possible biases.

Step 1: Model Family Spending

We use an episodic simulation model to predict annual expected spending under four types of insurance plans. Episodes take one of four types: hospitalization, acute outpatient, chronic outpatient, and well care. Within the model, episodes are generated for each individual as if healthcare is free. Individual and family characteristics influence both the rate of episodes and their cost. Correlations across episode types for an individual and within families were observed in the underlying data and are replicated in the model. Two important findings from the RAND HIE simplify the model structure. First, individuals and families decide whether or not to seek care in response to illness episodes. So insurance affects the number of episodes treated, and the effect differs by type of episode. However, once care is initiated, doctors largely determine the treatments that are given. Thus, cost-sharing provisions of insurance have only a minimal effect on the cost of the episode. Second, individuals and families respond only to the current level of cost sharing when they make treatment decisions and do not anticipate future changes in the price schedule in making current decisions.

As a result, insurance—through the current cost-sharing provisions—determines whether people seek treatment for a particular episode, and this

is modeled as a Bernoulli censoring process. The level of cost sharing determines the censoring rate. Throughout the insurance year, the level of cost sharing changes as deductibles and maximum expenditure caps are met. Episode costs are generated from log cost distributions specific to each episode type. The model has been tested extensively in its original version and on more recent data and has consistently predicted the level of insurance premiums and health spending accurately (Buchanan et al. 1991; Marquis and Buchanan 1994; Keeler et al. 1996).⁶

Each replication of the model yields an expected level of spending under each insurance plan. Ten replicates of annual expenditures were used to identify the distribution of expenditures facing each family under each plan. Information about the distribution of expenditures is used by the family in making their insurance choices, as described further on.

We modeled a health insurance market in which three types of plans (and no insurance) are offered. All plans cover the same broad set of services; they differ only in terms of the cost-sharing provisions and the degree to which care is managed:

- The first plan is a typical FFS policy, with a \$250 deductible, a 20 percent coinsurance rate above the deductible, and an annual \$1,500 cap on out-of-pocket expenses. It includes typical cost control measures of today's FFS plans.
- The second plan is the MSA/catastrophic option. This consists of a catastrophic plan with a \$1,500 individual deductible and a \$3,000 family deductible, the minimum requirement for HIPAA. The companies offering these plans are assumed to manage hospitalizations, but not less-expensive care purchased out-of-pocket. The employer deposits the difference between the FFS premium and the catastrophic premium in the MSA.⁷
- The third plan is a typical staff model HMO with no cost sharing. This HMO is assumed to have expenditures similar to the baseline fee-for-service plan just described.⁸
- The fourth choice is no insurance.

Step 2: Compute Community-Rated Premiums

Premiums for single workers and families are calculated separately and are computed as the product of average covered expenses and a loading fee. Average covered expenses are community rated across the full CPS non-elderly sample.⁹ These represent the average amount the insurance company would have to pay to each single worker or family that contained a worker in

a small business. For example, to compute the premiums for singles, we first compute each single worker's covered expenditures under each insurance alternative (FFS, MSA, HMO) given expected expenditures. To obtain the premium, average covered expenditures under each plan are then multiplied by the firm size-specific loading fee. These loading fees were 40 percent for the smallest firms (1–4 workers), 35 percent for firms with 5–9 workers, 30 percent for firms employing 10–24 persons, and 20 percent for firms with 25–49 workers (Phelps 1992). The larger loading fees are an important reason why such firms may not offer insurance.

Step 3: Evaluate Health Plans for Each Family

In choosing among plans, the family is assumed to maximize its expected utility, where utility depends on the value of health spending and on after-tax income net of health expenses. The choice of health insurance plan is made before the family knows what health events will occur during the year. Instead, the family has expectations about the probability of occurrence of different illnesses. Plans with different cost-sharing provisions and different premiums will result in different spending and different healthcare out-of-pocket payments for the family. We assume that the employer contributes a fixed amount equal to the premium of the FFS insurance option for single workers and a fixed amount equal to the family FFS premium for workers with families, as recommended by Enthoven (1988). This amount is then allocated to health insurance—and if a less expensive plan is chosen—the remainder is allocated either to an MSA or a wage increase.

More formally, we assume individuals and families get utility $\tilde{U}(H, C)$ from health (H) and consumption of a non-health good (C). Utility is separable in health and consumption. If we scale health (H) in willingness-to-pay units, then we can write $\tilde{U}(H, Y) = H + U(C)$, where $U(C)$ is the utility derived from the non-health good. We assume that individuals evaluate the expected utility of consumption in terms of the mean and variance:

$$EU(C) = E(C) - \frac{1}{2}r \text{Var}(C),$$

where r is our measure of risk aversion (Pratt 1964).

There are two constraints in the model. First, consumption of other goods is given by annual earnings (W_0) minus the premium P_j for plan j and out-of-pocket expenditures on all illness episodes. More formally, given a set of health shocks $\{s_i\}$ during the course of a year, we can write:

$$C = (1 - t)(W_0 - P_j - MSA_j) - \sum_i OOP(j, M^*(j|s_i)) + MSA_j,$$

where $M^*(j|s_i)$ is the optimal demand for medical care given health shock s_i and plan j .¹⁰ Out-of-pocket expenditures (*OOP*) for a given shock depend on this level of demand, as well as the generosity of the plan itself. MSA_j is the deposit, if any, made by the employer and is nonzero only for the MSA plan. This is used to offset out-of-pocket expenses and hence to have more money available for consumption. If the individual does not have any out-of-pocket expenses, this money is assumed to go into a savings account that has the same value as current consumption. This is the best-case scenario for MSAs—that a dollar in an MSA is equivalent to a dollar of consumption financed with pretax income.¹¹ The actual size of the MSA contribution is the difference between the FFS premium and a catastrophic premium into the MSA.

Second, health is given by the initial health level plus the cumulative effects of all health shocks during the year. The purchase of medical care offsets these health shocks according to the value function V , which is given by the area under the demand curve, assuming that demand reflects the marginal value of health (Keeler, Buchanan, and Rolph 1988). Thus we have:

$$H = H_0 - \sum_i [s_i - V(M^*(j|s_i))]$$

Plugging these constraints into the expected utility function gives the following form for each plan j :

$$\begin{aligned} \overbrace{E\tilde{U}_j(H, Y)}^{\text{Value of plan } j} \equiv & \underbrace{\tilde{H}_0}_{\text{Constant}} + \underbrace{(1-t)(W_0 - P_j - MSA_j)}_{\text{Net after-tax wage}} + \underbrace{MSA_j}_{\text{MSA contribution}} - \\ & \underbrace{E\left[\sum_i OOP^*(j|s_i)\right]}_{\text{Out-of-pocket expenses}} + \underbrace{E\left[\sum_i V(M^*(j|s_i))\right]}_{\text{Value of care}} - \underbrace{\frac{1}{2}r \text{Var}\left[\sum_i OOP^*(j|s_i)\right]}_{\text{Risk}} \quad (\text{Eq. 1}) \end{aligned}$$

Here we have simplified the notation so that $OOP^*(j|s_i) \equiv OOP(j, M^*(j|s_i))$ is optimal out-of-pocket expenses and $\tilde{H}_0 \equiv H_0 + E[\sum_i s_i]$ is the expected health stock in the absence of any medical intervention. The value of care may be thought of as the most that a family would pay out of pocket for it; because of insurance, some people may buy care whose value is less than the total spending (insurance payments plus out-of-pocket spending). If they do, the waste is the difference between total spending and what they would have paid out-of-pocket (value).¹² Risk is the amount a family would pay to avoid the uncertainty in out-of-pocket payments and is assumed proportional to the variance of out-of-pocket expenses.¹³

Using the ten replications of spending and out-of-pocket expenses from Step 1, we are able to approximate the distribution of out-of-pocket expenses and total medical expenses. From these we calculate expected out-of-pocket expenses, expected value of care, and risk associated with each plan option for each family. Employees then choose the plan that maximizes net after-tax value.

Our selection model focuses on expected use of services and costs, but in choosing a healthcare plan individuals also consider such factors as control over choice of doctor and over amount of care. Insofar as FFS and MSA/catastrophic plans rank better than HMOs on these nonfinancial criteria, patients may choose such plans over HMOs despite higher expected total costs. As a result, we assume, as in Keeler et al. (1996), that a dollar of HMO care is worth the same as 90 cents of FFS care to its recipients.¹⁴

In all these financial considerations, families consider their tax liability. Employer contributions to MSAs and health premiums are exempt from social security payroll taxes and from federal and state income taxes. We assume that the combined marginal tax rate is 32 percent for single-person households with income less than \$24,750, for single-parent families with income below \$34,880, and for two-parent families with income less than \$42,940, and 45 percent for those with a higher income.

We also collect measures of tax cost and net societal benefit for each plan. Tax costs to the government include the forgone taxes on employer-paid premiums and on contributions to the MSA. Net societal benefit is the value of the plan to the consumer minus the tax cost.

Step 4: Model Firm's Decision to Offer

Firms offer at most one plan in our model. In keeping with the extant literature on benefit policies, the firm's decision is based on the preferences of the individual workers (Smith and Ehrenberg 1983). Plan selection has three steps. First, we calculate the value of each option to all of the individuals in a firm and assume that employees "vote" for their most preferred option. Second, based on a decision rule to combine the votes of its employees, the firm picks which plan to offer. If no insurance is the preferred choice by a clear majority of workers, then the firm does not offer insurance (Goldstein and Pauly 1976; Keeler, Morrow, and Newhouse 1977). In the third step, we consider two scenarios: one in which all employees are covered by the insurance, if offered, and one in which the worker can decline the insurance in return for a wage increase. We consider the 100 percent participation to

be our base case since it does not require employers to give wage increases to employees who reject the offer.

We considered several decision rules for combining votes. Our main finding, that MSAs will not have a substantial effect on the decision to insure, does not appear sensitive to the decision rule. We ultimately use a two-stage process. In the first stage, each employee votes for the plan that offers the highest net after-tax value, where a plan choice includes the “no insurance” option. If a majority of employees elect “no insurance,” then the firm does not offer insurance. If the firm decides to offer insurance, we move to the second stage, where the firm chooses the plan with a plurality among those who elected coverage. In all stages, ties are broken by summing the net value of each plan over all workers and choosing the plan with the highest sum. This is the plan with the largest net benefit across the options.¹⁵

We also develop rules for families with two workers. Some workers in two-worker families will be covered by their spouse’s insurance coverage, and coverage at their own firm would have little value to them. We assume that if the primary worker is in a large firm, then that worker covers the rest of the family. The small-business spouse is kept in the sample as a single individual, covered under the spouse’s plan. Such small-business spouses always vote for “no insurance,” because the cost of other policies to them is their premium, and there is no benefit. Families where both spouses work in small firms are cloned into two voting units, with the primary wage earner “keeping” the children. We downweight these subfamilies by a factor of two in our Results section so that they influence our statistics as if they were only one family.

Step 5: Model Family’s Decision on Whether to Purchase

It is common insurance industry practice to require the participation of 75–100 percent of small-business employees to avoid adverse selection. Thus, after each firm has picked a plan, our base case is that all employees are required to join. This is tantamount to the case where the employer nominally contributes most of the premium cost—a common practice among businesses. As a sensitivity analysis, we also consider a voluntary scheme in which employees who voted for any type of insurance choose the option that is offered by the firm, while those who preferred no insurance elect not to be covered.

Data

All model estimates are based on the universe of workers in firms with 50 or fewer employees in the 1993 CPS Employee Benefits Supplement sample, a

sample of the March 1993 CPS who were working for pay at the time of the survey. The CPS does not cluster the sample by firm, but we are interested in whether small firms might choose to offer insurance. To model this decision, we use the methods and data of Buchanan and Marquis (1998), who grouped workers into synthetic firms based on (1) their reported firm size; (2) whether the firm offered health insurance as a benefit; and (3) the wages of workers in the firm. Data from the 1989–1991 Health Insurance Association of America (HIAA) annual employer surveys were used to measure the homogeneity of the wage distribution within firms of similar size that made the same decisions about offering insurance. Firms in the HIAA were classified based on the share of employees falling into three wage cells: less than \$10,000 per year; between \$10,000 and \$30,000 per year; and \$30,000 and over per year. Workers in the CPS were then linked into firms based on the two known characteristics (1) and (2), and on the probability of belonging to a firm with a particular wage distribution, given reported CPS wages. This process yielded 1,027 small firms.

RESULTS

Table 2 shows the outcomes across plans, assuming that everyone chose that plan. Given a choice, everyone would not choose the same plan, but these calculations are useful for comparing plans without any selection effects. Results are similar for singles and families, but we will comment just on families. Spending in the FFS plans is 6 percent higher than in the MSA/catastrophic plan, reflecting the generous deductible and coinsurance rate. By construction, the HMO has the same level of spending. The difference is consistent with Keeler et al. (1996). Without insurance, families spend less, but all spending is out-of-pocket. The MSA has somewhat higher out-of-pocket expenses because of its high deductible. We assume that the firm deposits the difference between FFS and MSA premiums in the MSA account: this is \$388 annually for singles ($2,256 - 1,868 = 388$), and \$1,284 for families, well under the 65 percent of the deductible maximum allowed by law.

All HMO care is prepaid through premiums. This means that the HMO not only has the highest premium, but that it also has the highest tax break since premium contributions are tax-exempt. This tax break may partially explain the popularity of HMOs among employees. By design, the MSA and the FFS plan have the same tax advantage: the MSA deposit, which is not subject to income or payroll taxes, is exactly equal to the premium savings

Table 2: Simulated Outcomes Across Health Plans Assuming 100 Percent Participation, by Single and Family Plans

<i>Outcome</i>	<i>All Singles Enrolled In</i>			
	<i>FFS</i>	<i>MSA</i>	<i>HMO</i>	<i>No Insurance</i>
Spending	2028	1951	2028	1626
Out-of-pocket expenses	389	600	0	1626
Premiums	2256	1868	2782	0
Tax break	787	787	970	0
Waste	238	193	417	0
Risk	49	89	0	3762
After-tax value to single*	3645	3750	3561	0
Social value†	2858	2963	2591	0

<i>Outcome</i>	<i>All Families Enrolled In</i>			
	<i>FFS</i>	<i>MSA</i>	<i>HMO</i>	<i>No Insurance</i>
Spending	5685	5319	5685	4432
Out-of-pocket expenses	1191	1830	0	4432
Premiums	5653	4369	7177	0
Tax break	2119	2119	2691	0
Waste	627	617	1133	0
Risk	174	267	0	7344
After-tax value to family*	7503	7699	7410	0
Social value†	5384	5580	4719	0

Note: Includes all single workers and families with at least one worker in a small firm. Families with two workers in small firms, which are split into two for the purposes of making an insurance choice, are downweighted to count as one.

*Measured relative to "No Insurance." This represents the benefits of insurance (reduced risk, lower out-of-pocket expenses, and increased value of care as measured by spending minus waste) minus the costs of insurance (reduced after-tax wages, measured as the premium minus the tax break).

†HMO care valued at 90 percent of FFS care.

relative to FFS. Despite the MSA's high deductible, the MSA substantially lowers the risk of catastrophic loss relative to no insurance. MSAs also discourage waste relative to FFS and HMO plans. On average, the MSA provides the most value to families and society.

Table 3 summarizes the choices of health insurance by workers in firms with fewer than 50 workers. We ran our simulations under two different sets of plan options, the first representing a world without tax-advantaged MSAs, and the second with them. Without MSAs, we find that 54 percent of small-business employees are covered by ESI, 37 percent in their own name and 17 percent through a spouse's employer. The model also predicts that 41 percent of small-business employees are offered insurance through their own employer, of whom FFS covers 33 percent and HMOs cover 67 percent.

Table 3: Simulated Effect of MSA Availability on Workers' Insurance Through Employers

Regime	% With ESI*	% Offered ESI	Among Those Offered a Plan Through Small Firm (%)			
			FFS	HMO	MSA	Decline†
<i>Employees must accept insurance offer</i>						
Without MSAs	54	41	33	67	n/a	n/a
With MSAs	56	43	3	41	56	n/a
<i>Employees can decline insurance offer</i>						
Without MSAs	43	41	21	42	n/a	36
With MSAs	44	43	2	26	36	36

*ESI = employer-sponsored insurance. Includes 17 percent of the population who receive coverage through a spouse's employer.

†Those offered employer-sponsored insurance may decline either because of coverage through a spouse or insufficient demand.

When MSAs are an option, the offer rate rises modestly to 43 percent, and the coverage rate rises to 56 percent. The most dramatic change is that the MSA draws away almost all of those formerly in FFS, and attracts 56 percent of those offered a plan.

To see how well the model is working, we can compare our "without MSA" figures with reported data on ESI from Table 1 and other sources. We estimate a coverage rate of 54 percent in Table 3. We know from Table 1 that the actual coverage rates for employees in firms with fewer than 50 employees should be approximately 57 percent, which is very close to our estimate.¹⁶ With regard to the distribution of type of plan, Ginsburg, Gabel, and Hunt (1998) report that, by 1996, only 29 percent of workers in small firms that offer insurance are in FFS plans. This figure corresponds closely with our findings: in a world without MSAs, we find 33 percent in FFS plans.

In the bottom panel of Table 3, we consider a voluntary version of step 5 in which workers may opt out of the insurance offered by the employer. We find that the coverage rate falls to 43 percent without MSAs and 44 percent with MSAs. The overall result—that MSAs do not increase the coverage rate appreciably but are still popular—does not change.

Table 4 investigates employee preferences in more detail. It compares the FFS spending (a proxy for healthcare needs), income, and family size across preferred plan groups for those offered insurance. For instance, the column labeled "Decline: Covered by Spouse" represents the workers (and

their families) who would decline employers' offers in our voluntary scheme because of coverage availability through a spouse. In a world without MSAs, these families tend to be larger (3.17 members) and to have higher incomes (\$53,363). In addition, if these families were enrolled in the FFS plan, they would spend, on average, \$5,735.

Those who would like to decline coverage due to insufficient demand appear to be healthier—both with and without MSAs.¹⁷ Their FFS spending would be only \$1,424 per insurance unit in a regime without MSAs and \$1,399 with MSAs—far lower than the simulated spending levels for those in the FFS or HMO. This lower spending in part reflects their smaller family size and lower incomes, but much of the difference is due to better health. These families prefer to take cash wages instead of premiums. We also see in Table 4 that HMOs are attractive to the wealthier workers. This makes sense, because HMOs allow workers to prepay care with pre-tax dollars, and those with higher incomes face higher marginal tax rates.

Finally, the row showing "Average FFS spending" gives a measure of health risk across plans. We see that the MSA is not attractive to exceptionally good health risks, as some critics have hypothesized. Instead, these healthy people prefer to decline insurance. Also, the higher-income employees prefer to stay with the HMO.

Table 4: Simulated Preferences Among Those Offered Insurance

Measure	Insurance Choice*				
	FFS	MSA	HMO	Decline†	
				Insuff. Demand	Covered by Spouse
Without MSAs					
Average FFS spending‡	6,845	n/a	6,441	1,424	5,735
Average income	30,538	n/a	45,960	32,893	53,363
Average family size	2.41	n/a	2.71	2.11	3.17
With MSAs					
Average FFS spending‡	5,853	6,710	6,163	1,399	5,641
Average income	34,010	36,361	47,007	32,610	53,120
Average family size	2.33	2.52	2.73	2.09	3.17

^aIncludes only those offered insurance by their firm.

[†]Workers and their families can decline coverage either because of insufficient demand (i.e., they prefer no insurance) or because coverage is available through a spouse.

[‡]Simulated expenditures standardized so that every insurance unit (single or family) is covered by a FFS plan.

Table 5 shows decisions to offer insurance by firms of different size. Without MSAs, 36 percent of very small firms (1–9 employees) offer insurance, compared with 48 percent of larger firms (10–49 employees). With MSAs, there is a modest increase in the probability of offering insurance for both very small and larger firms. Interestingly, the fraction of firms offering an HMO rises with firm size. This reflects the earnings patterns: larger businesses tend to pay more, so workers face higher marginal income tax rates. This increases the incentive to prepay care through the HMO. Making MSAs available does not appreciably change these patterns.

Table 6 compares the average family welfare in a world with, and without, MSAs. These figures average across all types of insurance chosen by workers and their families: none, FFS, HMO, and MSA. Overall spending does not change much, but premiums fall because out-of-pocket expenses increase. This is a consequence of the popularity of MSAs. Overall, the net after-tax value increases with MSAs. In both states of the world many workers still have no insurance, so they have large levels of financial risk.

POSSIBLE BIASES

All models simplify reality, and ours is no exception. In this section we document some of the key assumptions and their possible effects on our results. In most cases, the biases intentionally favor the case for MSAs.

First, we assume that there are no costs to the illiquidity of MSA deposits. To the extent that workers would prefer not to save for future out-of-pocket healthcare costs or retirement, the attractiveness of MSAs will be mitigated.

Table 5: Simulated Effect of MSA Availability on Firms' Decisions, by Firm Size

	<i>With MSAs</i>		<i>Without MSAs</i>	
	<i>Firm Size of</i>		<i>Firm Size of</i>	
	<i>1–9</i>	<i>10–49</i>	<i>1–9</i>	<i>10–49</i>
Number of Firms	881	140	881	140
% of Firms Offering	38	50	36	48
Among Firms Offering				
% offering FFS	6	2	45	23
% offering HMO	29	48	55	77
% offering MSA	65	50	n/a	n/a

Table 6: Simulated Effect of MSA Availability on Outcomes, Allowing for Firm and Family Selection

<i>Insurance Choice</i>	<i>Singles</i>		<i>Families</i>	
	<i>With MSAs</i>	<i>Without MSAs</i>	<i>With MSAs</i>	<i>Without MSAs</i>
Spending	1785	1793	4904	4974
Out-of-pocket expenses	954	880	2425	2179
Premiums	900	989	2730	3103
Tax break	357	356	1155	1169
Waste	132	158	445	502
Risk	1755	1801	3117	3232
After-tax value to unit*	2163	2083	4686	4471
Social value†	1806	1727	3531	3302

Note: Includes all families with at least one worker in small firm. Families with two workers in small firms, which are split into two families for the purpose of making insurance choices, are downweighted to count as one. Excludes families of workers insured through large firms (since type of insurance is unknown).

*Measured relative to "No Insurance." This represents the benefits of insurance (reduced risk, lower out-of-pocket expenses, and increased value of care as measured by spending minus waste) minus the costs of insurance (reduced after-tax wages, measured as the premium minus the tax break).

†HMO care valued at 90 percent of FFS care.

These families are assumed to have good estimates of the distribution of next year's spending and to make skillful, rational economic choices between their possible insurance options. To the extent that inertia, custom, or tastes incline them to particular kinds of insurance, MSA availability will have even less effect than we calculate.

Second, HMO care is valued at 90 percent of FFS care and does not vary with characteristics. The results are sensitive to this assumption. If HMO care is valued at 95 percent of FFS care, rather than the assumed 90 percent, then MSAs have even less effect on the overall rate of employer-provided insurance and draw fewer plan switchers from HMOs. However, recent research lends credibility to our estimate of 90 percent (Cardon and Hendel 1998). The value of HMO care also may vary with characteristics such as education—something we do not model. Relaxing this assumption would mitigate the finding that higher-income families prefer HMOs, but it would also obscure the differential tax advantages of HMO enrollment.

Third, we assume that HMOs and the FFS sector are equally efficient in providing care. In their comprehensive survey of the HMO performance literature, Miller and Luft (1994) identify only two studies that look at HMO

expenditures and meet their quality criteria. Both show reductions in HMO expenditures of between 11 and 13 percent. However, Miller and Luft conclude that "the recent literature on managed care plan performance does not provide policymakers with adequate bottom-line estimates of expenditure differences per enrollee compared with indemnity plans." Given this uncertainty, and our own skepticism that this literature can adequately control for preferential selection into HMOs, we chose to rely on the HIE, which randomized patients to an HMO. In the HIE, the plan with 25 percent coinsurance had more expenditures than the HMO plan, but that plan did not have a deductible. We have calculated that the addition of a \$250 deductible—part of our FFS plan here—would reduce expenditures to levels observed in an HMO (Buchanan et al. 1991).

Fourth, we consider only the case of employer-funded MSAs. However, MSAs are also offered to the self-employed, and preliminary evidence suggests that employee-funded MSAs are more popular, especially among professionals.¹⁸

Fifth, we assume that workers bear all the costs of employer-provided health insurance premiums in the form of lower wages. Most of the evidence from studies of other employer mandates supports this conclusion (Gruber and Krueger 1990; Gruber 1992). A similar type of cost shifting appears to occur with employee social security payroll taxes (Brittain 1971; Vroman 1974; Hamermesh 1979).

Finally, our premiums are computed assuming community rating. They are not updated based on the selection of risks, and consumers do not incorporate any expectations about possible selection in their forecasts. Essentially, this means that we are assuming no "adverse selection" spirals as MSAs select all of the good health risks. Our results do not show extreme selection into plans on the basis of health risks, suggesting that the market may be stable. However, it is not possible to predict outcomes accurately under experience rating with this model.

DISCUSSION

At the time the HIPAA was enacted, the MSA debate focused on the anticipated effects of MSAs on healthcare costs and adverse selection. Proponents argued that the combination of catastrophic insurance and MSAs reduces wasteful healthcare spending as previously insured consumers become more cost-conscious purchasers of services. Opponents argued that MSAs merely

provide a means for the healthy to “cash out” their existing health insurance policies, with adverse consequences for non-MSA-insured Americans. However, we and others found that the effects of MSAs (for employees of large firms offered a choice of plans) would be surprisingly modest along both dimensions (Keeler et al. 1996; Ozanne 1996). These negative results on cost control and adverse selection are confirmed in this article for small businesses. However, the earlier work did not resolve the issue of whether or not MSAs could provide an important policy tool for encouraging the purchase of insurance among small businesses.

In this analysis, we find that MSAs could be desirable to workers in firms that already offer HMOs or standard FFS plans. As a result, expanding MSA availability could make it a major form of insurance for covered workers in small businesses. We also see that the tax-advantaged MSA does not attract exceptionally good health risks, as some critics have hypothesized. Instead, these healthy people decline any insurance.

Even so, our simulations suggest that MSAs would provide only a limited impetus to businesses that do not currently cover insurance. This is consistent with other research on the difficulty of increasing coverage in the small group market. Thorpe, Hendricks, Garnick, et al. (1992) found that even paying substantial subsidies to small firms for the purchase of health insurance resulted in only modest increases in coverage; Chernen, Frick, and McLaughlin (1997) and Marquis and Long (1995) find similar responses. If MSAs were available, overall welfare would be slightly improved. The tax costs of health insurance would remain essentially unchanged because, from the government’s perspective, a loss of revenue on MSA deposits is offset by the lower premium contributions by firms.

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NOTES

1. Other reasons cited for not offering insurance include uncertain profits, uncertain premium increases, and consideration of employee preferences for higher wages. The survey was performed by Wayne State University and KPMG Peat Marwick. A response of either *very important* or *somewhat important* to a question was considered an affirmative reply.

2. Major provisions of the federal MSA legislation include the following: (1) the deductible on the catastrophic policy must be between \$1,500 and \$2,250 for an individual, or between \$3,000 and \$4,500 if the plan covers family members; (2) the cap on annual out-of-pocket expenses cannot exceed \$3,000 for individual coverage and \$5,500 for family coverage; (3) funds withdrawn from the MSA to pay for medical expenses are excludable from gross income, but only to the extent that such services are not compensated for by the catastrophic plan; (4) the amount put in the MSA each year that can be deducted or excluded from income is limited to 65 percent of the deductible for individuals, and 75 percent of the deductible for families; (5) MSA funds used for nonmedical expenses will be taxed as ordinary income, plus a 15 percent penalty on the amount withdrawn (the penalty is waived after age 65, death, or disability); and (6) participation is capped by law at 750,000 policies, although participants who have been uninsured for the past six months are not counted against the cap.
3. Some individuals may be willing to forgo the additional tax advantage of an employer MSA so that they can make MSA contributions in an employee MSA that exactly offset their out-of-pocket expenses during the year. We do not model this preference. The preference for an employer-funded MSA will be mitigated for those who are self-employed when premiums become 100 percent deductible for income tax purposes.
4. Buchanan and Marquis (1998) group workers into synthetic firms based on (1) their reported firm size; (2) whether or not the firm offers health insurance as a benefit; and (3) the wages of workers in the firm. This is the only time we use information about actual insurance coverage in our model.
5. Only 14 percent of firms with fewer than 50 employees offered a choice of more than one plan in a Robert Wood Johnson Foundation survey of ten states (Cantor, Long, and Marquis 1995).
6. One possible criticism of the HIE data is their age. The management, delivery, and mix of healthcare services have changed dramatically since the late 1970s and early 1980s, and the model has been adjusted to reflect the general shift from inpatient to outpatient settings. Further, we maintain that human nature regarding tradeoffs between money and health has not changed much. A recent health insurance experiment in China, for example, found that responses to various coinsurances for medical care were similar to the responses seen in the HIE. In addition, we have updated the model to reflect changes in health spending from the time of the HIE to 1996 using data from the Health Care Financing Administration and the National Medical Expenditure Survey (NMES).
7. We do not consider the case of a catastrophic option without an MSA because MSAs confer preferential tax advantages with little if any cost.
8. The assumption of equal spending with the FFS plan is discussed in more detail at the end of the article.
9. A separate set of runs on small-business workers and their families indicate that premiums would not change much if they were based solely on this smaller group.
10. In practice, optimal demand depends not only on the current health shock but on past health shocks as well, since our episodic model updates demand depending on the effective coinsurance rate facing the family at each point in time.

11. Employees can withdraw MSA balances to pay for current non-health consumption, but this requires payment of income taxes, as well as a 15 percent penalty. The penalty makes it expensive to use MSA funds for non-healthcare services.
12. Value of care can also be thought of as the out-of-pocket cost plus consumer surplus associated with each treated episode. Here we have assumed that each individual has a demand curve that is proportional to the overall demand curve. Value is then computed from the individual's point of indifference between purchasing and not purchasing the episode. This makes the value of care in the no insurance case exactly equal to spending, and for all other plans the value of care is spending minus waste. We will rely on this latter formulation in our computations.
13. For small gambles, the risk premium can be approximated by $r/2 \times$ variance of out-of-pocket spending, where r is Pratt's measure of risk aversion (Pratt 1964). We use this expression with the estimate of $r = .0007$ (in 1996 dollars). This value comes from the estimate of .0011 (1983 dollars) by Marquis and Holmer (1986). Despite recent evidence of differences in risk aversion between rich and poor, we assume that everyone has the same value because the size of the difference is so imprecisely measured.
14. An alternative rationale for this assumption is that perhaps HMOs today truly do cut expenditures by 10 percent relative to the modeled FFS plan, but the HMO premium is not reduced proportionately because of the higher HMO administrative costs. Then even if those signing up for HMOs were not concerned about freedom of choice, their value of the reduced care would remain 90 percent that of FFS.
15. An example might prove illustrative. In a firm with nine employees, three workers prefer no insurance, three prefer HMO insurance, and three prefer an MSA. In the first stage, a clear majority is in favor of offering insurance. For the second stage, the tie between MSA and HMO is broken by comparing the sum of the net value of "HMO" for three employees with the sum of the net value of the MSA for the other three. If HMO insurance provides more value, then the firm will offer an HMO.
16. Table 1 shows employment figures for three firm size groupings: 1-9, 10-24, and 25-99. If we assume that one-third of the workers in the 25-99 group are actually in firms of size 25-49, then the weighted-average percentage with ESI is 57 percent for workers in firms with fewer than 50 employees.
17. The selection patterns are different if employees are given *multiple* options by the employer. This situation was considered in our other article (Keeler et al. 1996), where we also found that some healthy people prefer MSAs. In Table 4, the choice is between an MSA and no insurance. It is not surprising that we find that those who opt for no insurance tend to be the healthiest.
18. A self-employed individual who owns a small firm has the option of setting up either an employer or an employee MSA. For those whose incomes are below the social security threshold, the employer MSA is a more attractive option financially since it is exempt from both income and FICA taxes, whereas an employee MSA is exempt only from income taxes. This may explain why the employee MSAs appear to be most successful among professionals.

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